

007034 USA PQ3/DSM/BCVD/JW
Application No: 10/824,313
Page 2 of 13

IN THE CLAIMS

Please substitute the following listing of claims for the previous listing of claims.

1. (Currently amended) A method for treating a silicon nitride (Si_xN_y) film to reduce a H content in the film, the method comprising:
forming the silicon nitride film; and
electron beam treating the silicon nitride film with a sufficiently high electron dosage to reduce a H content of substantially an entire thickness of the silicon nitride film.
2. (Original) The method of claim 1 which further comprises heating the film to a temperature in a range from about room temperature to about 700 °C.
3. (Original) The method of claim 1 wherein the step of electron beam treating includes exposing the film to electron beam current at doses in a range from about 100 $\mu\text{C}/\text{cm}^2$ to about 1000 $\mu\text{C}/\text{cm}^2$.
4. (Original) The method of claim 1 wherein the step of electron beam treating further includes exposing the film from about 0.5 minutes to about 120 minutes.
5. (Original) The method of claim 1 wherein the step of electron beam treating comprises placing the film in an ambient gas in a chamber wherein an electron beam is formed between a cathode and an anode, and providing a cathode voltage in range from about -.5 KV to about -10KV.
6. (Original) The method of claim 5 wherein the ambient gas is one or more of: Ne, He, Ar_2 , H_2 , O_2 , Kr, Xe, and N_2 .

007034 USA P03/DSM/BCVD/JW
Application No: 10/824,313
Page 3 of 13

7. (Original) The method of claim 5 wherein a pressure of the ambient gas in the chamber and a working distance between the cathode and the anode are maintained so that arcing does not occur between the cathode and the anode.

8. (Original) The method of claim 5 wherein the pressure of the ambient gas in the chamber is maintained at one or more levels that provide a substantially constant electron beam current during at least one treatment period.

9. (Currently amended) A method for fabricating a pMOSFET, the method comprising:

- oxidizing a gate;
- forming a gate electrode;
- implanting to form shallow source/drain extensions;
- forming a SiN gate sidewall;
- electron beam treating the SiN gate sidewall with a sufficiently high electron dosage to reduce a H content of substantially an entire thickness of the SiN gate sidewall ~~silicon nitride film~~;
- implanting to form ~~source/drain~~ source/drain deep junctions; and
- activating the source/drain.

10. (Previously presented) The method of claim 9 wherein the step of electron beam treating includes heating the SiN gate sidewall to a temperature in a range from about room temperature to about 700 °C.

11. (Previously presented) The method of claim 9 wherein the step of electron beam treating includes exposing the SiN gate sidewall to electron beam current at doses in a range from about 100 $\mu\text{C}/\text{cm}^2$ to about 1000 $\mu\text{C}/\text{cm}^2$.

007034 USA P03/DSM/BCVD/JW
Application No: 10/824,313
Page 4 of 13

12. (Previously presented) The method of claim 9 wherein the step of electron beam treating includes exposing the SiN gate sidewall from about 0.5 minutes to about 120 minutes.

13. (Previously presented) The method of claim 9 wherein the step of electron beam treating comprise placing the SiN gate sidewall in an ambient gas in a chamber wherein an electron beam is formed between a cathode and an anode, and providing a cathode voltage in range from about -.5 KV to about -10KV.

14. (Previously presented) The method of claim 13 wherein the ambient gas is one or more of: Ne, He, Ar₂, H₂, O₂, Kr, Xe, and N₂.

15. (Previously presented) The method of claim 13 wherein a pressure of the ambient gas in the chamber and a working distance between the cathode and the anode are maintained so that arcing does not occur between the cathode and the anode.

16. (Previously presented) The method of claim 13 wherein the pressure of the ambient gas in the chamber is maintained at one or more levels that provide a substantially constant electron beam current during at least one treatment period.

17. (Previously presented) The method of claim 9 comprising electron beam treating the silicon nitride SiN gate sidewall with a sufficiently high electron dosage to reduce a H content of the silicon nitride film through substantially the entire thickness of the silicon nitride film.

18. (Previously presented) The method of claim 1 comprising electron beam treating the silicon nitride film with a sufficiently high electron dosage to reduce a H content of the silicon nitride film through substantially the entire thickness of the silicon nitride film.

007034 USA P03/DSM/BCVD/JW
Application No: 10/824,313
Page 5 of 13

19. (Currently amended) A method for treating a silicon nitride film, the method comprising:

forming a silicon nitride film having a thickness; and

electron beam treating the silicon nitride film by exposing the silicon nitride film to electron beam current at doses in a range from about 100 $\mu\text{C}/\text{cm}^2$ to about 1000 $\mu\text{C}/\text{cm}^2$ with a sufficiently high electron dosage to reduce the H content of the silicon nitride film through substantially the entire thickness of the silicon nitride film.

20. (Currently amended) The method of claim 19 wherein the step of electron beam treating includes exposing the silicon nitride film to electron beam current at doses in a range from about 100 $\mu\text{C}/\text{cm}^2$ to about 1000 $\mu\text{C}/\text{cm}^2$ from about 0.5 minutes to about 120 minutes.